

REMARKS

Claims 1-19 are pending in the application. Claims 1, 6, and 14 have been amended. FIG. 3 has been amended. No new matter has been added by these amendments. Those amendments and the following remarks are believed to be fully responsive to the Office Action mailed July 22, 2004 and to place all the pending claims in condition for allowance. The foregoing amendments are taken in the interest of expediting prosecution, and there is no intention of surrendering any range of equivalents to which Applicant would otherwise be entitled in view of the prior art. Allowance of the application is requested in view of those amendments and the following remarks.

AMENDMENT TO THE DRAWINGS

FIG. 3 has been amended to interchange the words "YES" and "NO" associated with element 86. This change is consistent with the description of FIG. 3 found in paragraph [0020] and makes the figure consistent with that paragraph.

CLAIM REJECTIONS – 35 USC § 102

Claims 1, 2, 8, and 14 were rejected under 35 USC 102(b) over Takami et al. (6,084,418). This rejection is believed to be in error for at least the following reasons. Although the Examiner asserts that the electrodes disclosed in Takami et al. are "configured to facilitate measurement of capacitance C_f and C_i between the outer electrode and the shell (Fig. 5)," there is, in fact, no disclosure or suggestion in Takami et al. of measurement of any capacitance value. More importantly, there is no disclosure or suggestion in Takami et al. that the power applied to a heater of an oxygen sensor be in response to a measured capacitance as recited in claim 1. Similarly, there is no disclosure or suggestion in the cited reference that capacitance between the outer electrode and the case of a test sensor mounted in a motor vehicle be measured as a function of operating conditions of the motor vehicle, that heater rod temperature settings be determined in response to the capacitance measured, and that a control unit of a motor vehicle in which

an oxygen sensor is to be installed be programmed to supply heater power to the heater rod of the oxygen sensor to achieve the determined heater rod temperature settings, all as recited in claim 8. In summary, the Takami et al. reference does not disclose or suggest the claimed step of measuring capacitance of an oxygen sensor and cannot, therefore, suggest any claimed subsequent method steps that are based on the measurement of capacitance. Although Takami et al. may disclose a microprocessor connected to the oxygen sensor, there is no disclosure or suggestion that the microprocessor is so connected to facilitate the measurement of any capacitance. Independent claims 1 and 8 thus distinguish over the cited reference because the reference fails to disclose or suggest claimed method steps. Claim 2, dependent from claim 1, distinguishes over the cited reference for at least the same reasons that claim 1 distinguishes over that reference.

Claim 14 recites, in part, "first and second electrodes coupled to a control unit to facilitate measurement of capacitance between the outer electrode and the shell during operation of the motor vehicle." The Takami et al. reference does not disclose or suggest that electrodes coupled to the outer electrode and shell are also coupled to a control unit to facilitate measurement of capacitance between the outer electrode and shell of an oxygen sensor. The cited reference thus fails to disclose or suggest a recited element of claim 14. Accordingly, claim 14 is believed to distinguish over the cited reference and to be in condition for allowance.

CLAIM REJECTIONS – 35 USC § 103

Claims 3-5, 9-13, and 17 were rejected under 35 USC § 103(b) in view of Takami et al. This rejection is believed to be in error for at least the following reasons. First, claims 3-5 and 9-13 are dependent, either directly or indirectly, from either independent claim 1 or independent claim 8. These claims therefore distinguish over the cited reference for at least the same reasons as do the independent claims from which they depend. In addition, claim 3 recites "applying a first level of power to the heater if the capacitance is greater than a first predetermined capacitance value and the rate of change of measured capacitance is greater than a first predetermined rate." The cited Takami et al. reference does not disclose the measurement of either capacitance or rate of change of

capacitance and thus cannot suggest the claimed step of applying a power level based on such a measurement. Claims 4 and 5, each of which depends from claim 3, recite further steps relating to the application of power to the heater of an oxygen sensor based on measurements of capacitance or rate of change of capacitance. Claims 4 and 5 thus distinguish over the cited Takami et al. reference for at least the same reasons claim 3 distinguishes over that reference.

In a similar manner, claim 9 recites the step of "selecting a first heater rod temperature setting for a first temperature in response to measuring a capacitance greater than a first predetermined capacitance and a rate of change of capacitance greater than a first predetermined rate." The cited Takami et al. reference does not disclose the measurement of either capacitance or rate of change of capacitance and thus cannot suggest the claimed step of selecting a first heater rod temperature based on such a measurement. Claims 10 and 11, each of which depends from claim 9, recite further steps relating to the selecting of a heater rod temperature based on measurements of capacitance or rate of change of capacitance. Claims 10 and 11 thus distinguish over the cited Takami et al. reference for at least the same reasons claim 9 distinguishes over that reference.

Claim 12, which depends from claim 8, recites "programming the control unit further comprises the step of programming the control unit to supply a first power level to the heater rod to achieve a first heater rod temperature for a first predetermined motor vehicle operating time." The cited Takami et al. reference does not disclose or suggest the step of setting the heater rod temperature based on motor vehicle operating time. Claim 13, which depends from claim 12, adds a further step in controlling the heater rod temperature in response to the motor vehicle operating time exceeding a predetermined time. The additional step is neither disclosed nor suggested by the Takami et al. reference. Claims 12 and 13 thus also distinguish over the cited reference.

Independent claim 17 recites, in part, "measuring capacitance and rate of change of capacitance between the electrode and the shell." Based in part on these measurements, the power level of heater power is maintained or increased. The Takami et al. reference neither discloses nor suggests the steps of measuring either capacitance or rate of change of capacitance. The cited reference therefore also cannot suggest the

additional steps of setting power levels in response to capacitance and rate of change of capacitance measurements. Accordingly, claim 17 cannot be obvious in view of the cited Takami et al. reference because a number of recited method steps are not suggested by the reference.

The Examiner suggests it would have been obvious to modify Takami et al. to include the above recited method steps because Takami et al. discloses an oxygen sensor that is structurally similar to the oxygen sensor disclosed by Applicant. The cited Schreiber case, however, is easily distinguished. Schreiber deals with an apparatus claim having functional limitations. The court found those functional limitations to be inherent in the structure. That is not the situation in the present application. The claims at issue are method claims, and the claimed method steps are not disclosed or suggested by the cited reference. The cited reference, further, does not suggest any need or motivation for such claimed method steps. Similarly, in the cited Fitzgerald case the court applied product by process principles in rejecting an apparatus claim. The claimed apparatus was substantially similar to the prior art and the court held that the functional limitations in the claim were inherent in the prior art. Again, that holding is not applicable in the present application because the claims at issue are method claims, and the claimed method steps are not disclosed or suggested by the cited art.

Claims 6, 7, 18, and 19 were rejected under 35 USC § 103(b) in view of Takami et al. in view of Tomisawa (2003/0010088). This rejection is believed to be in error for at least the following reasons. Claims 6 and 7 depend either directly or indirectly from claim 1 and claims 18 and 19 depend either directly or indirectly from claim 17. Claims 1 and 17 distinguish over the cited Takami et al. reference for the reasons given above. The Tomisawa reference does not disclose or suggest the steps of measuring capacitance and applying power to a heater in response to the measured capacitance, nor does it disclose or suggest measuring rate of change of capacitance and maintaining or increasing power level in response to the measured rate of change of capacitance. The Tomisawa reference thus fails to supply at least these elements missing from the Takami et al. reference. Claims 1 and 17 as well as claims 6, 7, 18, and 19 thus distinguish over the cited combination of references for at least the reasons set forth above with respect to claims 1 and 17. In addition, although the Tomisawa reference discloses a timer, there is

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no disclosure or suggestion that the time measured is used to set the power level of a heater in an oxygen sensor. Accordingly, claims 6, 7, 18, and 19 distinguish over the cited combination of Takami et al. and Tomisawa.

The Examiner did not mentioned claim 16 in the Office Action. This was probably an oversight. Claim 16 distinguishes over the cited Takami et al. reference for at least the same reasons as claim 14 from which it depends.

ART CITED BUT NOT RELIED UPON

The art cited by not relied upon has been carefully reviewed but is not believed relevant to the invention as claimed.


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CONCLUSION

In view of the foregoing amendments and remarks, it is now believed that claims 1-19 are in condition for allowance and such allowance is therefore earnestly requested. If for some reason Applicant has not requested a sufficient extension and/or has not paid a sufficient fee for this Response and/or for the extension necessary to prevent abandonment on this application, please consider this as a request for an extension for the required time period and/or authorization to charge Deposit Account No. 50-2091 for any fee which may be due.

Respectfully submitted,

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AMENDMENT TO THE DRAWINGS

Please amend FIG. 3 as indicated on the accompanying informal drawing sheet. The proposed changes have been clearly marked. A formal substitute drawing sheet will be submitted by applicant upon indication of allowable subject matter.